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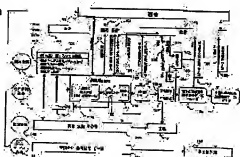
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(54) USER PARTICIPATING TYPE DESIGN SUPPORTING SYSTEM IN HOUSE INDUSTRY

(57)Abstract:

PROBLEM TO BE SOLVED: To design a residence with a user's participation.

SOLUTION: A user participating type design supporting system in a house industry consists of at least a means for providing a home page for designing a residence for a user to access, a user designating area for the user to perform the schematic design of the residence including or without including a planning area on the home page, a request inputting means for inputting an item which the user requests in the user designating area, a means for allowing the design supporting data base to operate on the home page by connecting the home page and the design supporting database mounted to the server previously, a checking means to be performed in connection with a request inputting item inputted to the user designating area with the operation of the design supporting data base and an informing means for informing the user of a result obtained by the checking means.



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CLAIMS

[Claim(s)]

[Claim 1]A means to set up a homepage for housing plans for a user to peruse, The user appointed field for a user to perform outline design of a residence without including a planning field on said homepage or containing, A request input means which inputs a matter which a user demands in said user appointed field, A means by which a design supporting database with which a server was equipped beforehand is connected with said homepage, and said design supporting database operates on said homepage, A checking means performed by relating with said request input item inputted into said user appointed field when said design supporting database operated, User participatory type computer-aided design in a reporting means which notifies a user of a result obtained by said checking means, and the housing industry characterized by a thing constituted even if small, ** et al.

[Claim 2]User participatory type computer-aided design in the housing industry according to claim 1, wherein an addition estimated field for said user to perform outline design of a residence is formed on said homepage.

[Claim 3]User participatory type computer-aided design in the housing industry according to claim 1 or 2, wherein said checking means contains at least one of a site condition and a budget, related laws and regulations, safety as a structure, and many of the functions as a dwelling.

[Claim 4]User participatory type computer-aided design in the housing industry according to claim 1 or 3 including an after-check correcting means which corrects inconvenience produced by said checking means, and corrects said user appointed field without a user's comprehension or comprehension.

[Claim 5]User participatory type computer-aided design in the housing industry according to claim 2, wherein said addition estimated field contains at least one of setting out of specification about setting out of a simulation and various installation specification to a budget, and exterior, and the setting out of building each part specification.

[Claim 6]As opposed to outline design data created based on the user appointed field and a request input item which were corrected by correcting means after said check, or said reporting means, User participatory type computer-aided design in the housing industry according to claim 1 to 5 having a judgment field about conclusion of the deal on said homepage and which is a statement either.

[Claim 7]User participatory type computer-aided design characterized by comprising the following in the housing industry according to claim 6.

A needs trend database construction means related with said outline design data by grasp of a user request content made into "no", and its tendency when it is considered as "no" in said conclusion-of-the-deal judgment field.

A reconstruction means of a design supporting database which is updated by said design supporting database with which a server was equipped beforehand, and said needs trend database, and is associated.

[Claim 8]User participatory type computer-aided design characterized by comprising the following in the housing industry according to claim 7.

A design means of a recommendation design plan which is related with said needs trend database and a design special person performs.

A means to show said homepage said recommendation design plan, and an outline design means which a user performs by relating with said recommendation design plan.

[Claim 9] User participatory type computer-aided design characterized by comprising the following in the housing industry according to claim 6.

A detail design means which is related with said outline design data and a design special person performs when it is considered as "formation" in said conclusion-of-the-deal judgment field.

A construction means related with said detail design data.

A maintenance means performed to a construction article built by said construction means.

** — even if small — one means.

[Claim 10] User participatory type computer-aided design characterized by comprising the following in the housing industry according to claim 9.

An output means of a design document in which said detail design means was related with said detail design data.

An application-for-building-confirmation means about construction performed with said design document.

[Claim 11] User participatory type computer-aided design characterized by comprising the following in the housing industry according to claim 9.

An output means of a working budget document which said construction means was related with said detail design data, and was drawn up.

A placing means of factory parts related with said detail design data, and on-site parts.

A field management means of a completion situation related with said detail design data.

An inspection means of a building related with said detail design data, a delivered means of a construction article related with said detail design data, and at least one means of **.

[Claim 12] User participatory type computer-aided design in the housing industry according to claim 11, wherein a placing means of said factory part contains at least one of a schedule control in connection with a material procurement, subassembly production, and part production which a section specializing in a physical distribution service performs, and the delivery managements of a finished part.

[Claim 13] Completion information which shows the contents of completion in connection with a completion situation where an inspection means of said building was related with said detail design data, Complete examination result information on a building related with said detail design data, User participatory type computer-aided design in the housing industry according to claim 11 including at least an output means which notifies a user of construction condition data obtained using said completion information and said complete examination result information.

[Claim 14] A construction means of a construction object database related with construction object data in which said maintenance means was accumulated from an input means of said requirements for a user, A means by which said homepage and said construction object database with which a server was equipped beforehand are connected, and said construction object database operates on said homepage, User participatory type computer-aided design in the housing industry according to claim 9 characterized by maintenance service business over a construction article related with said construction object database, and a thing constituted even if small, ** et al.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the user participatory type computer-aided design in the housing industry with a user and an architectural design construction contractor able to start the user participatory type computer-aided design in the housing industry, especially to realize a user's request cooperatively in a housing plan.

[0002]

[Description of the Prior Art]The housing plan support software in connection with the housing plan using a general-purpose personal computer etc. is known for the general user at the house etc. When that program file is distributed via communication lines, such as the Internet and personal computer communications, to this kind of housing plan support software, By means in case storages, such as CD-ROM in which the program file of housing plan support software was stored, are distributed, it is provided for a general user.

[0003]As for a general user, it is possible for each one to perform arbitrary housing plans with housing plan support software using a general-purpose personal computer etc. Thus, when a general user designs, a general user, Unlike the case where the housing plan person who has a know how designs, there are little information about the safety and laws and regulations of the main information at the time of designing a residence, for example, each part article, the special information on each materials, and a residence, etc., and The sake, The engineering-drawing side which ordinary customers design only expresses the room arrangement considered as a customer's hope in two dimensions. It cannot necessarily say [that it can build and].

[0004]In the above-mentioned housing plan support software, the offer of information about the engineering-drawing side which the general user designed will not be performed to the housing plan support soft donor side, a housebuilder, etc., but only a user will own a design data.

[0005]On the other hand, when the designer who has a know how designs, in order to make an engineering-drawing side, it is usually that a variety of "CAD software" is used. Generally, the building is realized in assembling which combined various parts. When each part article currently used there or they are assembled and it completes as a building, the state is expressed in the engineering-drawing side, making full use of geometric elements, such as a line segment and a circle.

[0006]However, although considering the original role of a design such drawing work is also important work, in order to fulfill the function and quality which are made into the purpose, it is much more more important for the building which it is trying to make from now on to grasp various characteristic information of part each to be used.

[0007]Even if it takes each parts, construction material, mass, capacity, a standard, a part number, a manufacturer, cost, a schedule, --, etc. have the various characteristics and information which cannot be expressed in shape besides the shape.

[0008]Although the method of giving as an attribute of a part shape (geometric element by which grouping was carried out) is also tried by the part, there is still a limit in the use, and when the

conventional "CAD" is also many, it depends for these on a designer's experience etc.
 [0009]For example, the CAD system as a drafting tool, CG, the presentation using image processing, There were many places for which the original computer applications in a design act are single use of computation etc., respectively, or it depends on a designer's capability including word processing by the word processor and spreadsheet software and numerical processing, structural calculation, air conditioning load calculation, etc.

[0010]On the other hand, progress of the latest information technology has a remarkable thing. These days, information gathering using a network is performed and the environment about information technologies, such as a cooperation design by the information analysis by various kinds of database construction, groupware, etc., has suggested changing the technique of the conventional system design a lot.

[0011]Then, according to Japanese Patent Application No. 11-236215, the invention about the recording medium which recorded the designing device and design program using the designing method using the object-orientation used suitably for buildings, such as a building, and object-orientation is made.

[0012]Here, an approximate account is performed about above-mentioned Japanese Patent Application No. 11-236215. As an example, designing devices (general-purpose personal computer etc.) are installed in each place of business of a housebuilder. The designing device is equipped with the transmission and reception section for communicating with the portion, memory measure, and output means which perform an input means and data processing. The same equipment configuration as the above-mentioned exists, and the server side in a place of business is equipped with various housing support database groups. A designer is operating various databases via intranet, and performs a housing plan on a WWW browser.

[0013]As an output means, in the case of a monitor display, the picture of space specification is displayed, the picture to which the "girder group" was set is displayed, the picture of "internal fittings specification" is displayed, and the picture of a "new part (windproof girt) addition", etc. are displayed, for example. On the other hand, although an input means specifies "unit space", "selection by a dialog" is possible also for any. That is, while two or more persons including a customer inquire, it can input.

[0014]For example, the geometrical modelling explained in full detail later, the design model of a building, the structural part model of a building, the least common denominator model of a building, the component (design result data) of a building, etc. are associated mutually, and are chosen. The housing plan support database is constituted by each model groups.

[0015]Here, geometrical modelling is a model which makes rectangular parallelepiped space (a ** type, and its line and point), two or more rectangular parallelepiped space (a polygon, and its line and point), and the multiple pillar space (duplication of the polygon of a double layer, and duplication of a line) of a double layer generate from the inputted unit space, and generates the various geometrical information acquired on each space.

[0016]First, the relation of each part articles (portion) and those aggregates (whole) is modeled. Next, the modeled each part article (portion) is treated as an "object", and a function, an attribute, and a relation are set up to each part article (portion). The environment (share environment of a model) in which cooperation working is possible is formed via a network.

[0017]Next, the concept of the model showing the relation of a building and its part is explained. As a system of the model of this example, it comprises geometrical modelling which caught the whole building from shape, and a part model arranged at each part of the shape, and the part model has set to what comprises three models, a structural part model, a design section article model, and a common-parts model. Here, the approximate account of the relation between geometrical modelling and a part model is carried out. If geometrical modelling generates all the unit space data of the rectangular parallelepiped space which contained the two from specification of two diagonal unit space, the data of the side of rectangular parallelepiped space, and the data of the four corners of rectangular parallelepiped space and two or more rectangular parallelepiped space is generated. The data of the peripheral side face as multiple pillar space and an inner side face and the data of the corner as multiple pillar space are generated. If double layer generation of the multiple pillar space is carried out, the data which can judge the relation

between each class about the data already generated as multiple pillar space will be generated. A part model is treated as data which structured the material (parts) which constitutes a building and had a function, an attribute, and a relation for every set-up each part article, and constitutes what is called an object oriented database. The function "to read geometrical modelling required for its function to operate" is the relation between a part model and geometrical modelling as one of the functions which the set-up parts have here.

[0018]The detailed explanation about these each model and the function for every each part article, Since the contents about the design procedure which treated those all as a database and was used as the space object database about the relation and the attribute overlap with the contents in Japanese Patent Application No. 11-236215, they omit explanation here.

[0019]Linkage in which each part articles in a housing plan and those aggregates, i.e., a "portion" and the "whole", were always able to take compatibility by the above-mentioned invention can be performed. It is that the designer itself mounts in CAD, a personal computer, a workstation, etc. by using a space object database as a design tool in the product development of a residence, and a design simulation can be done to the newly set-up parts. Data is sharable by adding new parts to a space object database in development departments and an operation section. A design rule can supply as a system. The characteristic of each part article can check on a model, and a simulation can be done from the attribute. Sharing, and an addition and correction of CAD data can be performed easily.

[0020]That is, simultaneously with product development, a system can create one by one and the test & simulation of it becomes possible. The data sharing of the structure created by development becomes possible at two or more copy gate. By ** in which a plan design and a production design carry out a simulation simultaneously, it becomes verifiable [the compatibility of a portion and the whole] each time. The design rule itself does not need to interpret by the ability to supply not as a document or a drawing but as a system. Simultaneously with goods (parts) development, a system can create one by one and can shorten a man day substantially. Access is possible from any environment, necessity is accepted, the contents can be added and a space object database can be corrected.

[0021]and the Internet or yne — a codfish — the cooperation design on a network is attained and the direct design on a homepage is performed at each establishment — things can be carried out.

[0022]Since the unit space of two corners of the space which it is going to set up was only specified, even the building component used for space and this space is calculated and a choice is shown, the designer can show a chief mourner etc. a concrete design plan promptly. A proposal of the plan which met the proposal of the plan (a customer intention was drawn) which forestalled more, and the chief mourner's life style, and the plan which can cope with the situation predicted is attained by accumulating the selected model as data.

[0023]As mentioned above, according to Japanese Patent Application No. 11-236215, it became possible to generalize a designing method. That is, the amateur was also can be designed when choosing conditions based on the guide on a screen, having included the function etc. of the parts assumed in the program and having a dialog with a computer, when designing beforehand.

[0024]

[Problem(s) to be Solved by the Invention]It is only expressing the room arrangement which is impossible for carrying out the check about a planning, and is considered as a user's hope from the shortage of design knowledge, engineering, etc., when a general user's designs using conventional housing plan support software, The design in consideration of the safety on various laws and regulations or structure, selection of material, the design of the building, etc. is almost impossible.

[0025]Also in budget planning, when conventional housing plan support software is used, the addition which accumulates required parts one by one is usually impossible about the estimate asked for synthetic judgment, although it is theoretically possible. (Usually, only at a price of having accumulated the **** prices of required parts.) It does not become a market price. In order not to exchange not each other's data about the software maker for which a general user uses conventional housing plan support software individually and which this provides with a

housebuilder or housing plan support software, and a design specification, Since addition and an estimate are not performed to the building which designed, a general user is unable to get to know a rough budget.

[0026]By what the recording medium which recorded the designing device and design program using the designing method using the object-orientation used suitably for buildings, such as a building, and object-orientation is used for when performing a housing plan according to Japanese Patent Application No. 11-236215. It became possible to generalize a designing method. That is, the amateur was also can be designed when choosing conditions based on the guide on a screen, having included the function etc. of the parts assumed in the program and having a dialog with a computer, when designing beforehand.

[0027]However, in order that the designer from whom these computer-aided design has acquired technical information may perform the above-mentioned designing method, A housebuilder uses the database for housing plan support (space object database). While install the server which equipped them, a general-purpose personal computer etc. are installed as a client to each place of business of a housebuilder, a client is connected with a server and a user attends via intranet, Or when a housing plan is requested from a user and it designs on a WWW browser, it is used effectively. In such a case, the user cannot take part in designing operation directly.

[0028]Although a designer makes arrangements with a user and the design which drew a user's request as much as possible is performed, the case where a request is not met arises with how often. The contents of a design and specification are changed each time, and although it is ideal to do consensual validation work promptly as for the designer and the user, they need actually complicated work and are impossible. Therefore, there is a problem that it is difficult to perform designing operation immediately corresponding to a user's design request, and a user's request is not efficiently reflected to a housing plan.

[0029]Since a user's request is not efficiently reflected to a design, a user will make demands for a design again on a designer, and the designing operation which a designer performs will be repeated in how often. Thus, there is a problem that designing operation is inefficient-like.

[0030]Next, a general user conventional housing plan support software only by using individually. Since a user's design data is not provided to the maker [which performs design and build of the construction called housebuilder], housebuilder [which provides housing plan support software], or software maker side, There is a problem that feedback cannot perform many a user's requests to a coming housing plan for a housebuilder etc.

[0031]A designer receives a user's request and the standard example of a housing plan plan is shown to a user in the stage of designing. Although the request which asks a residence for the example of a housing plan plan since a standard plan is shown to a user's family structure, a generation, a site condition, etc. is various, Since it is designed in the viewpoint of the housebuilder (designer), there is a problem that it is not the example of a plan which constructed many a user's requests. Therefore, naturally a design variation arises to the example of a plan, and how often and a design are repeated. Thus, it is difficult to perform the design which met a user's request altogether, and technically, in being impossible, persuasion is needed [in a designer, / from on a regulation etc., / for a user] also in the case where designing operation is repeated.

[0032]As further problem, when a user requests a design and construction to a housebuilder, an architectural firm, etc., a user is deficient in the technical information in connection with housing construction, and depends for the housing construction itself to a housebuilder, an architectural firm (design special person), etc. for the reasons of the complicatedness of formalities, etc. in many cases. As a result, the situation where sufficient prior check, inspection, surveillance, and field management are not enough performed to the building under a design and construction and after construction may also be produced, and there is also a possibility that troubles, such as a defect of a construction building, may arise.

[0033]Since the required information in connection with housing construction is special contents, the housebuilder side also has a possibility that the grade which shows a user (client) flat-surface sketch drawing about a housing plan cannot explain detailed explanation about various drawings etc. and formalities enough. Originally, to the user who is a client, a designer performs

presentation and an indication and the design document submitted when performing the application for building confirmation for building is giving sufficient explanation. [0034]However, the user in the tendency for which it is deficient in information or knowledge and depends on a designer may not come to examine the design document. Almost all formalities are requested from a design special person as a result, while a user has not done the check of a design document enough, it consents, and the application for building confirmation may be made. Even if a presentation indication is carried out and a design document is explained to a user, the right or wrong judgment over a design document is difficult for the user who has not participated in designing operation.

[0035]In the conventional building work, the exchange of the information on each section, such as a design department, a construction section, and a factory section, is performed on documents, such as engineering drawing and a working budget document. For example, at a factory, without transmitting all, in a factory section, information required for part production, such as a member of materials, quantity, and a standard, will collect part pertinent information anew again, and will utilize only from engineering drawing. It is easy to produce parts supply, the increase in a process of operation of an assembling production line, and the problem of construction period delay as a result.

[0036]The user can grasp neither a completion situation nor a field management situation, unless it goes at an inquiry and the spot to a housebuilder directly. When the user about these information or the contents of an inspection result and the transfer between housebuilders are insufficient, there is a problem connected to the trouble after construction during construction.

[0037]Next, after a construction article is handed over, the complaint receptionist window is performing telephone correspondence etc., but the after-sale service of the conventional construction article post turnover is one thing of the cause of a complaint for which mutual cooperation is not efficiently made between a user and a housebuilder. In many users' building, when many same troubles occur, a housebuilder will cope with the trouble for every user each time, and has as a housebuilder the inconvenience that working efficiency is bad.

[0038]Then, the purpose of this invention, The object-orientation used suitably for the design of buildings, such as a building. By using the business-use design supporting database (space object database) of the user specification provided with the recording medium which recorded the designing device and design program using the designing method and object-orientation which were used, It is in providing the user participatory type computer-aided design in the housing industry for a user to participate in the design act of his building, and perform a cooperation design with the brokerage department and design department of a housebuilder.

[0039]Other purposes of this invention are to provide the user participatory type computer-aided design in the housing industry with them. [able for many housebuilder sides to grasp a user's request and to provide the housing plan recommendation plan corresponding to needs to a user]

[0040]The further purpose of this invention is to provide the user participatory type computer-aided design in the housing industry with him. [able for a user to receive the presentation and detailed explanation of a design document which are obtained by a detail design from a designer, and to understand special contents]

[0041]The further purpose of this invention is to provide the user participatory type computer-aided design in the housing industry for performing a series of housing construction synthetically managed based on the design data.

[0042]The further purpose of this invention is to provide the user participatory type computer-aided design in the housing industry for performing maintenance management by which efficient-izing and automation are made promptly to the construction article of a post turnover using the database in connection with the construction article handed over to the user.

[0043]

[Means for Solving the Problem]This invention person uses a recording medium (Japanese Patent Application No. 236215 [11 to]) which recorded a designing device and a design program using a designing method using object-orientation, and object-orientation which were already invented, in order to solve an aforementioned problem, A business-use housing plan support

database (SODB: space object database) of a housebuilder is built, While a user uses web service by the Internet or intranet and peruses a homepage using a general-purpose personal computer etc. which were connected to a server equipped with a business-use space object database, This invention can be made by making it possible to perform outline design of user participation.

[0044]When a housebuilder introduces a business-use space object database adapted to its business here, It becomes possible [a user] to obtain environment where it can take part in the planning of a housing plan of the housebuilder concerned easily, and to outline design data, data check quicker than a design department and a brokerage department of a housebuilder and suitable and an additional input are performed, and it becomes possible to provide these information to a user.

[0045]Namely, according to the user participatory type computer-aided design in the housing industry concerning claim 1 of this invention, an aforementioned problem. A means to set up a homepage for housing plans for a user to peruse, The user appointed field for a user to perform outline design of a residence without including a planning field on said homepage or containing, A request input means which inputs a matter which a user demands in said user appointed field, A means by which a design supporting database with which a server was equipped beforehand is connected with said homepage, and said design supporting database operates on said homepage, When said design supporting database operates, it is solved a checking means performed by relating with said request input item inputted into said user appointed field, a reporting means which notifies a user of a result obtained by said checking means, and by [** et al.] being constituted even if small.

[0046]In the above-mentioned solving means, if an addition field for said user to perform outline design of a residence is formed on a homepage, it is more suitable. If said checking means is constituted so that at least one of a site condition and a budget, related laws and regulations, safety as a structure, and many of the functions as a dwelling may be included, it is preferred. And it is good to constitute so that an after-check correcting means which corrects inconvenience produced by said checking means, and corrects said user appointed field without a user's comprehension or comprehension may be included.

[0047]Said addition field is good to constitute so that at least one of setting out of specification about setting out of a simulation and various installation specification to a budget and exterior and the setting out of building each part specification may be included.

[0048]It is good to constitute to outline design data created based on the user appointed field and a request input item which were furthermore corrected by correcting means after said check, or said reporting means, so that it may have a judgment field about conclusion of the deal on said homepage.

[0049]When actually designing these, they are making indispensable conditions into a check item, unlike a case where a user is free and draws a floor plan arbitrarily, can be built substantially for a user and are enabling a user's request to design easily a dwelling reflected directly moreover. Designing operation time to conclusion of the deal performed when a user's satisfactory design is obtained can be shortened compared with a case where only a designer designs.

[0050]When it is furthermore considered as "no" in said conclusion-of-the-deal judgment field, by grasp of a user request content made into "no", and its tendency. It is suitable if it has a reconstruction means of a design supporting database which is updated by needs trend database construction means related with said outline design data, and said design supporting database with which a server was equipped beforehand and said needs trend database, and is associated.

[0051]When not resulting to conclusion of the deal, to outline design data, an addition of a revised element and correction are made, it is drawing up a recommendation plan according to a request content and grasp of a tendency of a user, and a budget, and a housebuilder always builds a needs trend database corresponding to a user's needs trend. Furthermore, a needs trend database is fed back to a business-use space object database. It is suitable if it has a design means of a recommendation design plan which is furthermore related with said needs trend database, and a design special person performs, a means to show said homepage said recommendation design plan, and an outline design means that a user performs by relating with

said recommendation design plan. It becomes possible to provide a housing plan means as new merchandise based on a trend of a commercial scene to a user using a business-use space object database reconstructed in this way.

[0052]A detail design means which is related with said outline design data and a design special person performs when it is considered as "formation" in said conclusion-of-the-deal judgment field. It is good to constitute so that it may have a construction means related with said detail design data, and a maintenance means and at least one means of ** which are performed to a construction article built by said construction means.

[0053]Said detail design means is good to constitute so that an output means of a design document related with said detail design data and an application-for-building-confirmation means about construction performed with said design document may be included.

[0054]A component (design result data) of a building and its historical data are accumulated through a required check item in the case of outline design. After resulting to conclusion of the deal, a design special person performs data check and an additional input for design-document creation using a business-use space object database, engineering drawing, an estimate, etc. are outputted, and it becomes possible to show a design document and an estimate to a user.

[0055]Since a user is taking part in the planning of outline design, when he is given for a design document, he can fully grasp the contents of a design and can still understand them. Therefore, it is possible to prevent a trouble by a defect of a building under construction and after construction.

[0056]An output means of a working budget document which said construction means was related with said detail design data, and was drawn up. A placing means of factory parts related with said detail design data, and on-site parts. It is good to constitute so that it may have a field management means of a completion situation related with said detail design data, an inspection means of a building related with said detail design data, a delivered means of a construction article related with said detail design data, and at least one means of **.

[0057]A placing means of said factory part is still better to constitute so that at least one of a schedule control in connection with a material procurement, subassembly production, and part production which a section specializing in a physical distribution service performs, and the delivery managements of a finished part may be included.

[0058]Completion information which furthermore shows the contents of completion in connection with a completion situation where an inspection means of said building was related with said detail design data. It is good to constitute so that an output means which notifies a user of construction condition data obtained using complete examination result information, and said completion information and said complete examination result information on a building related with said detail design data may be included at least.

[0059]And a construction means of a construction object database related with construction object data in which said maintenance means was accumulated from an input means of said requirements for a user. A means by which said homepage and said construction object database with which a server was equipped beforehand are connected, and said construction object database operates on said homepage. It comprises at least maintenance service business over a construction article related with said construction object database.

[0060]As mentioned above, based on a design data, a user, a design department, a brokerage department, a builder, a distribution arm, and a factory take part each other mutually in the planning, and it becomes possible from a design to manage construction and a series of building work to delivery. As a result, increase in efficiency of work can be attained because work for each section cooperates mutually with a design data. Since construction status information is always released by communication line, and the user can know grasp of the contents of completion, and an inspection result easily using means, such as an inspection of a homepage, it becomes possible to prevent a trouble between a user and a housebuilder after construction during construction.

[0061]

[Embodiment of the Invention] Hereafter, one example of this invention is described based on a drawing. The member explained below, the arrangement, etc. cannot limit this invention, and can

change it variously within the limits of the meaning of this invention.

[0062]The approximate account figure in which drawing 1 thru/or drawing 13 show one example of this invention, and drawing 1 shows an example of hard structure. A key map [in / in drawing 2 / a client/server architecture], the explanatory view showing work sequence [in / in drawing 3 / a client/server architecture], The schematic diagram concerning [drawing 4] the user participatory type housing plan supporting system use on the Internet, The block diagram showing the flow of a design data [in / in drawing 5 / a user participatory type housing plan supporting system], The functional flow chart of an outline design planning where a user performs drawing 6, the functional flow chart of outline design addition where a user performs drawing 7. When a design plan is updated based on the outline design to which a user performs the functional flow chart to the addition from the planning in the outline design to which a user performs drawing 8, and drawing 9, A functional flow chart with the case where a design document is outputted, the approximate account figure of a business-use space object database part [in / in drawing 10 / a user participatory type housing plan supporting system], Drawing 11 shows a functional flow chart [in / the whole user participatory type housing plan supporting system / in drawing 13 / the functional flow chart in a business-use space object database part and drawing 12 can be set to the approximate account figure of the whole user participatory type housing plan supporting system, and]. A flow chart for drawing 14 to explain the work sequence of the client/server architecture in drawing 3 in full detail, As opposed to the room space as which the setting-out example of a room space where a user or a designer assumes drawing 15 themselves, and drawing 16 were illustrated in drawing 15. The multiple pillar figure obtained by the geometrical modelling as a generated multiple pillar, the room space figure in which drawing 17 shows the mutual position relation between a standard layer and an arbitrary layer, The room space figure and drawing 19 which drawing 18 shows the data of the corner part of a standard layer and the halfway point between corners show a part of pillar pass (standard layer), some (standard layer) design results of a framing elevation, and some addition lists.

[0063]As drawing 1 shows, the designing device S in this example The keyboard mouse touch panel, the infrared rays, electric wave, electromagnetic waves, etc. as the input means 10 (part), The portion which calculates design operation (design engine) / input-and-output operation (output engines) - and others as the calculating means 12 (part) (CPU), It has the transmission and reception section to the exterior transmitted and received via RAM-ROM-HDD as the memory measure 14, etc. and printer 16a, displaying means 16b (for example, CRT, a liquid crystal, etc.) and the communication port 16c as the output means 16. Each means used for this designing device S is not peculiar to the designing device S, and it is needless to say that the peripheral equipment of things, such as a general-purpose personal computer, and others, etc. can be used.

[0064]At the input means 10, the directions to the calculating means 12, etc. are performed, by the calculating means 12, with the command from an input device, various data or a required program is acquired from the memory measure 14, and each necessary operation is performed. The program file of the design engine 12 is memorized beforehand ROM or HDD14, further --- a housing plan object, a department-for-housing article master, and a design model rule base group (a beam arrangement rule base.) And it is constituted by a pillar rule base and the fittings rule base, the program file of the rule base engine which is a central treating part of this rule base is also memorized beforehand ROM or HDD14. Input directions are performed, for example about a "pillar" from the input means 10. With these input directions, the program data of the design engine 12, the data stored in each database, and the program data of a rule base engine are incorporated into RAM, and data processing is carried out between CPUs. Especially in this example, from a pillar arrangement rule base, pillar information is extracted and check processing of the position of a pillar, thickness, etc. is performed. About the "pillar" in which the user did input directions, when correction is required, the measure of displaying a warning message to a user is performed. Some suitable "pillar" information for urging proper input directions with a warning message may be shown. And it outputs to the output means 16 as the result of an operation. The display to electronic / mechanical display for CRT as a monitor, a liquid crystal display, etc. to view as the output means 16, What is outputted to the exterior as data via the

output to the printer 16a (a dot printer laser beam printer, a liquid crystal printer facsimile machine, and a copy device are included) which performs the output to paper and other media, and the communication port 16c is included. The output to the exterior contains what is depended on a communication wire (an optical fiber etc. are included), and the thing to depend on infrared rays, an electric wave, electromagnetic waves, etc.

[0065]Next, a user explains the client server system which used the WWW service by the Internet and used communication lines which make it possible to perform outline design of a direct residence on a homepage, such as the Internet, using drawing 2 thru/ or drawing 4. Although fundamental composition performs selection of each model, an output, etc. in the above mentioned designing device S, in this example, it differs in that the client side is considering it as the role shared, respectively the server side.

[0066]Although the same equipment configuration as above mentioned drawing 1 exists in the server side, if it explains using drawing 2, it comprises this example via CORBA Service34 for Internet usage so that in-and-out power of the exterior and data may be further performed via the gatekeeper 37 and WWW server 38 grade. Applet30 which drives data on HTML language (or XML language), a JAVA language, etc. is introduced.

[0067]Thus, a network language (for example, JAVA language) and the distributed object environment 31 and 32 are used together, and the design engine 33 is mounted. It is expected that each design model components 35 and 36 performed in that case are object classes, and a man day can reduce them substantially to the usual design extension since a reuse design and a difference design are possible for them. Thus, in this example, on the Internet, it is a software configuration, and the environmental management for searching easily is using JAVA as language, and serves as sufficient correspondence.

[0068]And various kinds of databases 36 mentioned above in the server side in drawing 2 are saved, access this database, and between two or more places, for example, a brokerage department, a design department, and a user. It becomes possible to show a design simulation on a monitor, explaining to a user with a sound, looking at the state where it was displayed on a display. Thus, while the section of a construction speciality including a mechanical design, the brokerage department expert in the selling price etc., and the customer that is purchasers repeat satisfactory questions and answers, it becomes possible to constitute so that a concrete and visual design can be performed simultaneously.

[0069]Next, the client server system work sequence of drawing 3 explains the input means 10 in the above-mentioned designing device S, and the output means 16. For example, in the case of a monitor output, the design support homepage 39 is displayed on [39a] a WWW browser. A user chooses a "room name" on a WWW browser screen, and specifies "space" on [39b] a CAD browser picture. All the "room names" is similarly inputted for every story. The design engine which received these input and was memorized by ROM or HDD14 in the server side. The program data of a rule base engine and the data stored in various databases are incorporated into RAM, data processing is performed between CPUs, and the various databases operate. Therefore, all the geometrical modellings are generated based on specification of the "space" from a user. Various kinds of checks in connection with the size of a "room name" and "space" are performed, and plane shape is displayed on a browser. Therefore, the plane shape of each story is displayed in the user (client) side.

[0070]Next, in the user (client) side, the specification of construction Gentlemen equipment etc. is chosen on a WWW browser screen to the plane shape on a CAD browser picture. Geometrical modelling and the part model operate to the specification specified as the server side, required parts and member are set up, and the quantity is computed. Based on a commercial-scene unit price or a contractor unit price, addition is performed to all the parts and members. Therefore, the amount of money for estimated is computed and the amount of money for estimated is displayed in the user (client) side.

[0071]Next, in the user (client) side, requirements, such as living conditions, a design condition, and a site condition, are inputted. These requirements are analyzed and the plan nearest to conditions is searched with the server side from the accumulated collection of plans. About the searched plan, it corrects to an actual condition unit price from the unit price at the time of

registration, and the amount of money for estimated is computed. In this stage, an applicable plan is displayed on a CAD browser and the amount of money for estimated is displayed on a WWW browser screen at the user (client) side.

[0072] In order to explain the work sequence of the client/server architecture stated above in full detail, drawing 14 shows the flow chart. In Step 1, a user (client) specifies a room space to a standard layer (the first floor). After performing all the room space specification of a standard layer furthermore, the room space of arbitrary layers (the second floor, the third floor, ... etc.) is specified like room space specification of a standard layer.

[0073] In Step 2, as shown in [A-1] drawing 14, the room space to assume is specified on a plane unit space mesh, the diagonal position (the asterisk in a figure, and arrow), i.e., the corner space portion, of unit space. A user (client) or a designer carries out as an example of this specification, looking at the outputted image A-1 on a monitor.

[0074] In Step 3, as shown in [A-2] drawing 14, the data of all the unit space (the asterisk in a figure and dot region) included in the room space is generated from the data of the specified unit space. All setting out of the room space which a user or a designer assumes themselves shows drawing 15 the finished example. However, in the case of this example, it illustrates about a standard layer (the first floor) and an arbitrary layer (the second floor).

[0075] The room space picture shown in drawing 15 is outputted on a monitor as opposed to a user or a designer. In a standard layer (the first floor), the room name a, the room name b, the room name c, the room name d, the room name e, the room name f, the room name g, and the room name h are specified and set up by the above-mentioned method. Room space setting out in an arbitrary layer (equivalent to the second floor in this example) is performed similarly. However, on the input screen for specification outputted to a monitor. Although data (they are numerical values, such as 137, 136 and 135 of a statement among drawing 15, and ..., in this example) is not displayed only by the mesh display of a room space, these data (numerical value) is specified on data processing performed in the designing device S. The outputted image on a monitor is set to the inside A-2 of a figure, and B-2. The data (numerical value) of the designated part of the room space set up in drawing 15 is shown in Table 1. For example, a designated part is set to "134,393" in the room name a.

[Table 1]

指定した室空間の指定箇所		
	室名	指定箇所
基準層	(a)	134,393
	(b)	454,777
	(c)	259,325
	(d)	389,517
	(e)	386,515
	(f)	580,773
	(g)	578,643
	(h)	706,771
任意層	(i)	198,393
	(j)	454,585
	(k)	259,325
	(l)	389,581
	(m)	387,452
	(n)	515,580
	(o)	

[0076] Next, in Step 4, the monitor output of the inside A-3 of drawing 14 is carried out, in data processing performed in the designing device S, the geometrical modelling as a room space is created and these data is stored in a predetermined part from the data of all the unit space included in a room space.

[0077] The data of the geometrical modelling as a rectangular parallelepiped generated in Step 4 is shown by Step 5. Table 2 shows the data of the geometrical modelling as a generated

rectangular parallelepiped to the room space illustrated in drawing 15. However, mesh 1 unit length is set to P, for example, by the room name a, a "size" (length * width) is set to "5P*4P", and a "position" (on coordinates) is set to "2,5" here. The number of mesh (lattice) is meant, a "position" makes (0, 0) a reference point (it illustrates in drawing 15), and a "size" performs a coordinates display here. In the case of this example, the coordinates of a front left corner are meant among 4 corners of each **. The above geometrical modellings are generated in Step 3 thru/or Step 5.

[Table 2]

生成された直方体としての幾何学モデル			
		大きさ	位置
基準層	(a)	5P*4P	(2,5)
	(b)	6P*4P	(7,5)
	(c)	2P*3P	(4,2)
	(d)	3P*2P	(6,3)
	(e)	3P*2P	(6,1)
	(f)	4P*2P	(9,3)
	(g)	2P*2P	(9,1)
	(h)	2P*2P	(11,1)
任意層	(i)	4P*4P	(3,5)
	(j)	3P*4P	(7,5)
	(k)	2P*3P	(4,2)
	(l)	4P*1P	(6,4)
	(m)	2P*2P	(6,2)
	(n)	2P*2P	(8,2)

但し単位長さ：Pとする

[0078]In Step 6, each room name part as a design section article model reads each data of a room name applicable from geometrical modelling, i.e., a size, (length * width), and a position (on coordinates). Each room name part checks **** of a size as "length-between-couplings >= length and width >= minimum length" to its room name as the function.

[0079]In Step 7, as a result of performing the above-mentioned proper check, when it is YES, directions of the shape display are performed from the "size" of a room space, and "position" data as a function of the room name parts themselves. Here, the specification of one room in a standard layer (the first floor) is completed. In Step 6 and Step 7, each room name part in a design section article model operates. By one side, as a result of performing a proper check, when it is NO, in step 7, the message indicator of the purport that it re-evaluates to a room name as a function of the room name parts themselves since the size is unsuitable is directed. furthermore — in step 7 — as an example — a message indicator — "— if it computes from a module construction to the specified room name, the range of ****>= length and width >=**** is suitable, please re-specify, " — it is carried out and returns to Step 2.

[0080]In Step 8, the monitor output of the inside A-0 of drawing 14 is carried out from the display instruction of the room space shape from Step 7. In specifying the room space of further others after completion of the one-room specification by the above-mentioned work, it progresses to Step 9.

[0081]In Step 9, the room space which adjoined the room space displayed A-0 times on the monitor, and was assumed is specified. The same work as Step 2 described previously is done. On a monitor, the inside B-1 of drawing 14 is displayed.

[0082]In Step 10, the same work as Step 3 described previously is done. On a monitor, the inside B-2 of drawing 14 is displayed.

[0083]In Step 11, the same work as Step 4 described previously is done. On a monitor, the inside

B-3 of drawing 14 is displayed.

[0084]In Step 12, the same work as Step 5 described previously is done. Here, the geometrical modelling at the time of compounding two or more rectangular parallelepipeds is generated. Therefore, in Step 13, the geometrical modelling as a multiple pillar which compounded the already created geometrical modelling and new geometrical modelling is created, and it stores in a predetermined part. On a monitor, the inside B-4 of drawing 14 is displayed.

[0085]In Step 14, raw [of the various geometrical modellings as a multiple pillar at the time of compounding two or more rectangular parallelepipeds created in Step 13] is carried out. Table 3 shows a part of geometrical modelling as a generated multiple pillar to the room space illustrated in drawing 15. However, not only a standard layer but the arbitrary layer (in this example, it is the second floor) is displayed here. As a part of geometrical modelling generated from the multiple pillar of a standard layer here, The data (peripheral face data) of the peripheral side face of the multiple pillar, the data (density interface data) of the boundary side inside the multiple pillar, and the data of the result which considered it as the formed data (appearance and internal-corner classification of a corner part) of the corner part of the peripheral side face of the multiple pillar, and was generated are shown in Table 3. (In addition about the process generated, it shall be based on Japanese Patent Application No. 11-236215) About table 3[A [1]] peripheral face data. The side data currently generated from all the room space data in the above-mentioned multiple pillar is classified into the side of a peripheral part, and the internal side by the method of being based on Japanese Patent Application No. 11-236215, and the data selected as data of the side of a peripheral part is expressed. Similarly, about table 3[B [1]] density interface data, it is the method of being based on Japanese Patent Application No. 11-236215, the side data currently generated from all the room space data in the above-mentioned multiple pillar is classified into the side of a peripheral part, and the internal side, and the data selected as data of the internal side is expressed. About the appearance and internal-corner classification of the Table 3 [1C] corner part, it is the method that the data of the corner part currently generated from all the room space data in the above-mentioned multiple pillar is based on Japanese Patent Application No. 11-236215, and the data of a result in which the external corner and the internal corner were classified is expressed. Thus, as a result of specifying peripheral face data and density interface data, in drawing 16, the multiple pillar of the geometrical modelling as a generated multiple pillar is illustrated from the room space data illustrated in drawing 15, and this multiple pillar figure is outputted to a user or a designer, for example on a monitor.

[Table 3]

複数の直方体を複合した時に生成される 多角柱としての幾何学モデル				
	外周面データ	内部境界面データ	コーナー部の 出・入隅区分	
基準層	[1A]	[1B]	[1C]	
	+134~@=+1~+137 -138~@=64~-778 +841~@=1~+834 -770~@=64~-386 +386,-323,-259, +259,+260,+261, -198,-134	-262~@=64~-774 -388~@=64~-772 +454~@=1~+457 +578~@=1~+581 +387,+388,+389 +706,+707	出隅	入隅
			134,138	262
			842,834	387
			386,259	
任意層	[2A]	[2B]	[2C]	
	+198~@=+1~+201 -202~@=64~-586 +649~@=1~+643 -578~@=64~-258 +259,+260,+261 -198	-262~@=64~-582 -389~@=64~-581 +454~@=1~+457 +387,+388,+389 +515,+516	出隅	入隅
			202,650	262
			643,257	
			198	

[0086]In Step 15, each room name part reads each data (a size, a position) of a room name applicable from geometrical modelling as its a function, and checks duplication in the room space already specified.

[0087]In Step 16, in the check in Step 15, when there is no duplication of a room space, like Step 7 described previously, the shape is displayed from the "size" of a room space, and "position" data as a function of the room name parts themselves, and the inside B-0 of drawing 14 carries out a monitor output. Here, the specification of the 2nd room in a standard layer (the first floor) is completed. When there is duplication of a room space in step 16' by one side, the message indicator of the purport that the position specified as a function of the room name parts themselves overlaps with the position already specified in part, and re-specification is performed since the spacial configuration is impossible is directed, furthermore — in step 16' — as an example — a message indicator — "the specified position overlaps with the position already specified, please re-specify after checking a screen." — it is carried out and returns to Step 9.

[0088]In Step 17, the monitor output of the inside B-0 of drawing 14 is carried out from the display instruction of the room space shape from Step 16. In specifying other room spaces, it progresses to Step 18.




[0089]In Step 18, it adjoins further and a room space is specified. These room space specification work comprises Step 18 thru/or Step 26. These steps are equivalent to Step 2 thru/or Step 8 described previously and Step 9 thru/or Step 17. According to the work described above, two or more room spaces are specified as a standard layer (the first floor).

[0090]In Step 100, after the room space specification in a standard layer (the first floor) is completed, a room space is specified to an arbitrary layer. A layer is specified in Step 101. Specification of the room space in an arbitrary layer (equivalent to the second floor in this example), It is the same as that of the room space specification work of a standard layer, Step 102 thru/or Step 111 (except for Step 108) are comprised, and these steps are equivalent to the specification step 2 thru/or Step 8 and Step 9 thru/or Step 17 of the room space in the standard layer described previously.

[0091]However, in room space specification in an arbitrary layer, in Step 14, geometrical modelling when a multiple pillar is generated two or more layers is shown. The data in which the physical relationship of the corner part of the multiple pillar of an arbitrary layer and the multiple

pillar of a standard layer and the physical relationship of the peripheral face of the polygon of an arbitrary layer and the peripheral face of the polygon of a standard layer are shown is generated and displayed. Here, the data in which the mutual position relation between the corner part of the multiple pillar of an arbitrary layer of geometrical modelling when a multiple pillar is generated two or more layers, and the multiple pillar of a standard layer is shown is shown in Table 4 and drawing 17 from the figure of the example which all setting out of the room space which a user or a designer assumes themselves to drawing 15 finished.

[Table 4]

任意層の多角柱のコーナー部と 基準層の多角柱との位置関係	
基準層のコーナー部とコーナー間の中間点のデータ	
134,135,136,137,138,202,266,330,394,458,522,586,650,714,778,842,841,840,839, 838,837,836,835,834,770,706,643,578,514,450,384,387,323,259,260,261,262,198 (但し、太字はコーナー部のデータ)	
任意層のコーナー部のデータ	
198 : 基準層の中間点データと合致	
202 : 同上	
650 : 同上	
643 : + 8 - 1 + 3C - 4Cで(同上)	
259 : 基準層のコーナー部データと合致	
262 : 同上	

[0092]Next, the operation of various part models is explained in the room space which the user or the designer set up. As one example, the case where the pillar model of a peripheral face operates is explained. A peripheral face pillar section article system assumes that a peripheral face pillar is constituted by a corner part peripheral face pillar and the pars intermedia peripheral face pillar. A corner part peripheral face pillar comprises respectively a pillar influenced by others, and a pillar which is not influenced by others for an external corner and an internal corner, and a pars intermedia peripheral face pillar.

[0093]Here, the function of a peripheral face pillar section article is explained. The physical relationship (data of the corner part of a standard layer and the halfway point between corners) of the corner part of the multiple pillar of an arbitrary layer and the multiple pillar of a standard layer is read. To drawing 18, "the data of the corner part of a standard layer and the halfway point between corners" was illustrated here.

[0094]Next, "the data of the corner part of a standard layer and the halfway point between corners" read previously is classified. However, only a standard layer is targeted in an example here. The data of a corner part is made into A group, and the data on which a "external corner" and the marked data were marked with (A-1) and a "internal corner" is set to (A-2). On the other hand, the data of pars intermedia is made into B group, the data of (B-1) and others is set to (B-2) for the corner part of an arbitrary layer, and the marked data, and data reduction is performed. The table showing the classified data is shown in Table 5.

[Table 5]

基準層のコーナー部とコーナー間の中間点のデータの分類 (但し基準層のみ対象)		
コーナー部のデータ (A 群)	「出隅」と印されたデータ (A-1)	134,138,842,834,386,259
	「入隅」と印されたデータ (A-2)	262,387
中間部のデータ (B 群)	任意層のコーナー部と印されたデータ (B-1)	198,642,835,650,202
	その他のデータ (B-2)	135,136,137,266,330, 394, 458,522,586, 714, 778,841, 840,839, 838, 837,836,770, 706,578, 514,450,323,260, 261

[0095]Next, the function of a corner part peripheral face pillar section article is explained. The data of A group classified previously is read and "the peripheral column for external corners" is searched from a parts master to the data of the Table 5 (A-1) group. Here, a part symbol is temporarily set to "AA1." On the other hand, "the peripheral column for internal corners" is searched from a parts master to the data of the Table 5 (A-2) group. Here, a part symbol is temporarily set to "AA2." Data and a part symbol are carried out to a set, and the result searched by this appearance is stored in "the component file of a building." The set data of these "data and part symbol" in A group data is shown in Table 6.

[Table 6]

(データと部品記号) をセット	
「出隅」と印されたデータ (A-1) 群	134-AA1,138-AA1,842-AA1,834-AA1,386-AA1,259-AA1
「入隅」と印されたデータ (A-2) 群	262-AA2,387-AA2

[0096]Next, the function of a pars intermedia peripheral face pillar section article is explained. The data of B group classified first is read. A "pars intermedia peripheral column" is searched from a parts master to the data of the Table 5 (B-1) group as a pillar influenced by others. Here, a part symbol is temporarily set to "BB1." On the other hand, based on relation with the function of the parts set to the unit length of a mesh (lattice), a fittings position, etc. to the data of the Table 5 (B-2) group, "a pillar is assigned" for every field. In this example, it is assumed that it is what the pillar section article permissible to 1/2P shall be set up, and is influenced by fittings in no peripheral faces.

[0097]For example, the field of corner data [134-138] is explained. First, as a pillar influenced by others to the data of the Table 5 (B-1) group, as a result of searching, applicable data does not exist in 134, 135, 136, 137, and 138. When the data applicable to the Table 5 (B-1) group does not exist, it is calculated with position: $N = [(1) \{134 + 2P = 134 + 2 = 136 \text{ of total length: } L = (138 - 134) * P = 4P \text{ of a field, number: } N = L / 2P = 1 = 4P / 2P = 1 = 2 - 1 = 1 \text{ of a pillar, and a pillar.}$

[0098]Therefore, the set data of "data and a part symbol" in group data (B-2) is set to "136-BB2" by the above-mentioned calculation.

[0099]As other examples, the field of corner data [138-842] is explained. First, as a pillar influenced by others to the data of the Table 5 (B-1) group, as a result of searching, "BB1" is set up to corner data: 202 and 650. As opposed to the field of corner data [138, 202, 330, 394, 458, 522, 586, 650, 714, 778, 842], it divides into the field of corner data [138, 202], the field of corner data [202, 330, 394, 458, 522, 586, 650], and the field of corner data [650, 714, 778, 842]. Since middle data does not exist to the field of corner data [138, 202], setting out of a pillar section article does not exist. As opposed to the field of corner data [202, 330, 394, 458, 522,

586, 650], The total length of a field : $L1 = [(650 - 202) / 64] * P = 7P$ [number: $N1 = 7P / 2P - 1 = 2.5 - 0.5$] of a pillar. The position of a pillar: It is calculated with $N1(1) = 202 + (64 * 2) = 330$, $N1(3) = 650 - (64 * 2) = 522$, and $N1(2) = 330 + (64 * 2) = 458$. To ** of corner data [650, 714, 778, 842], it is calculated with position: $N2(1) = 650 + (64 * 2) = 778$ of the number: $N2 = 3P / 2P - 1 = 0.5 - 0.5 \rightarrow 1$ pillar of total length: $L2 = [(842 - 650) / 64] * P = 3P$ of a field, and a pillar.

[0100] The above calculated result data is obtained. Here, the searched result is stored in "the component file of a building" as set data of "the data and the part symbol" in B group data. The set data of these "data and part symbol" in B group data is shown in Table 7.

[Table 7]

B 群のデータ	(データと部品記号) をセット
任意層のコーナー部と 印されたデータ (B-1) 群	198-BB1, 642-BB1, 835-BB1, 650-BB1, 202-BB1
その他のデータ (B-2) 群	136-BB2, 330-BB2, 458-BB2, 522-BB2, 778-BB2, 840-BB2, 838-BB2, 837-BB2, 706-BB2, 514-BB2, 261-BB2

[0101] As mentioned above, the display of a design result is performed in an example in case the pillar model of a peripheral face operates. A part of pass (standard layer) of pillar arrangement and some (standard layer) design results of a framing elevation are displayed on drawing 19. The part where the pillar is arranged is expressed as a thick line among drawing 19, and the pillar section article sign of the part is indicated respectively. An addition list is also displayed. During this list, a part symbol and the quantity corresponding to it, a unit price, and the amount of money are specified. The user or the designer advances the design by presentation of these design results, an addition table, etc.

[0102] Next, as drawing 4 shows, in this example, the business-use space object database 40 which makes each model of a building a component in a place of business is formed on a server. It is connected to the general-purpose personal computer etc. which are installed at the user house 47a which is a client side via the communications network of a communication line (a cable and radio are not asked) and Internet 46 grade. A client side designing device may be installed in not only a user house but each establishment 47b, or the house exhibition halls 47c. In this case, he is able for a user to go to an establishment or an exhibition hall and to do outline design work on the spot.

[0103] It comprises the design result data 41 produced by the function of parts working about the server composition for places of business on the other hand, the geometrical modelling 43 obtained from specification of unit space, the structural part model 44, the design model 45, and common model 42 grade. Various kinds of elements are determined from the viewpoint of a function, and a viewpoint of an attribute about each contents, respectively. About the function of the detailed explanation and each model about these each model, a relation, and an attribute, since the contents about the design procedure which used the space object database 40 overlap with the contents in Japanese Patent Application No. 11-236215, they omit explanation here.

[0104] Next, the block diagram showing the flow of a design data in a user participatory type housing plan supporting system in drawing 5 is explained. Furthermore, drawing 5 is explained using drawing 6 thru/or drawing 9. A user peruses the housing plan support homepage 39 which this invention persons provide, and takes part in the planning of a housing plan on a homepage. The outline design work by a user is done by "commodity selection by plan search" 50, or "free design from plan 2 NGU" 60 on a WWW browser.

[0105] Outline design a "planning" 60 is explained using drawing 6. a "planning" uses the geometrical modelling generated from the room space specification work of the above-mentioned step 1? step 26 — the minimum — it is constituted by the required check item which comprises technical information, the design model rule base group (as a part of function of a beam part article — a beam arrangement rule base.) memorized ROM or HDD14 by the side of a server The rule base data and the program data of a rule base engine which were stored for a fittings arrangement rule base etc. constituting as a function of some pillar arrangement rule bases and fittings parts as a function of some pillar section articles, It is incorporated into RAM and data

processing is performed between CPUs, geometrical modelling is generated to the room space data which a user inputs, and a check is performed using various geometrical data.

[0106]The database of the function of the building part article group in connection with the site where a check item influences a design condition, for example, And the database 61 of the parts group in connection with a budget and a design condition. The database 62 of the function of the building part article group in connection with the regulation to influence, It comprises the database 63 of the function of the building part article group in connection with the roof shape which influences a design condition, the database 64 of the function of the building part article group in connection with the structure which influences a design condition, and other items of database 65 of function of building part article group in connection with general amenity **. As an example, it is as having been shown without the above-mentioned step 6, Step 7, Step 15, and Step 16. By a check item being displayed, a user collects information required for a design and inputs on the browser picture in a homepage. The user can obtain a suitable checked result from the housebuilder (server) side to input data at any time.

[0107]The check 61 of a site condition and a budget is explained. In order to begin a planning, the check of a site condition is required. According to a site condition, a large change of a plan and a budget may change a lot. It touches as investigation of subsurface exploration, a border line of lot, etc., a location survey, and a road, and touches as a situation and a neighboring house, and a situation, sunshine, and ventilation are obtained, or the check item of ** is mentioned. For example, it may arise that a long distance and outdoor water and drainage works are dramatically added by the case where ground reinforcement construction is added, and the main of water works etc. A site may take the preventive measures by reservation of consideration of drainage, such as making it higher as a principle than a road, the ground reinforcement construction to soft ground, banking, piling, etc., a landslide, etc. It is confirmed whether the construction which balanced the budget on that occasion is possible. In order to check such an item, it is required to set up several kinds of parts which constitute the applicable whole site and a site, and to build an object oriented database as a function of oneself of the part.

[0108]The "Building Standard Law", a "Building Standard Law enforcement ordinance", "Architects Law", the "Town Planning and Zoning Act", "road law", etc. have laws and regulations to a building or a site in the check 62 about related laws and regulations plentifully. A direction in case the contents about these regulations are provided by a housing plan supporting system based on a database rather than the case where it is explained by a text and oral is that the user can judge the success or failure on a regulation easily. As an example of regulation on a regulation, a house may be unable to be built depending on the area where the site concerned corresponds. For example, don't build a house in principle in the Urbanization Control Area. It receives, and in an urbanization zone, use zoning is specified and it is mentioned [that the use of the building built for every area, height, and a size are restricted, etc. and]. These information is stored in a server's database as a function of oneself of an applicable site, and especially a user investigates a site condition etc. and performs alter operation without the know how about law according to an inputted item. Check processing of the input data is carried out automatically, and a user is notified of a checked result.

[0109]To others, the regulation (building coverage, floor area ratio) on the size of a house, the regulation (a setback regulation, restrictions due to shadow) on the height and form of a house, the regulation (a fire zone, a semi-fire zone) on the structure and material of a house, the regulation (daylighting area) on lighting of a sitting-room, and the restrictions (distance preservation, bandage) from a neighboring house are mentioned. Several kinds of parts etc. which constitute several kinds of parts, building, and building where the contents about these laws and regulations constitute an applicable site and a site to the input data from a user perform check processing automatically as their a function.

[0110]Roof shape is greatly influenced about the check 63 of roof-shaped compatibility in connection with the design of the whole building, a construction method, structure, and the material of construction. Roof shape serves as a symbol of the building in many cases, and in order to influence design nature greatly, many three-dimensional shape which was varied is seen. In order to perform a check for that, the geometrical modelling about three-dimensional roof

shape is generated appropriately, the function of the building part article group in connection with roof shape operates using the geometrical modelling, and a check is performed.

[0111]Next, although the aggregate of each room space which the designer or the user assumed serves as space of the whole building about the safety 64 as a structure, the safety of a structure is establishing the safety of each part of the building to the safety as the whole building, and the next first. The safety as the whole building is checking the check (be safe to all the power which acts on the whole building) of a thing safe in structural mechanics as a structure, and the conformity to a regulation top. If it responds to a situation, it is providing the original safety-standards line of a housebuilder still severer than related laws and regulations, and it becomes possible to provide the residence which has a safer and firm drive unit structure.

[0112]In the check 65 of the function as a dwelling, the function relevant to mutual is checked to the check of many functions to one room space which the designer or the user assumed, and two or more room spaces. As a function to one room space, the check about the function of the fittings for the size to a use, and lighting and ventilation, a size, the function of the fittings for the position and receipts and payments, a size, its position, other arrangement of various equipment kinds, the operation point of those, etc. is performed. As a function to two or more room spaces, the check about the conformity to a piping [such as fittings arrangement accompanying the line of flow between ** to horizontal / vertical both directions and the line of flow, equipment arrangement accompanying the line of flow, electrical and electric equipment, gas, air conditioning, water works] for equipment and regulation top, etc. is performed. Therefore, the function of the building part article group in connection with amenity operates, and a check is performed.

[0113]As a result of the above-mentioned check, it may constitute so that it not only notifies to the user side, but the contents which agreed to various regulations etc. in the contents nearest to a user request may be displayed (a graphic display and drawing).

[0114]Through the above check item, as shown in drawing 7, "addition" 70 are performed.

"Planning" The simulation 71 to a budget is performed from the design result obtained by 60. Electric installation, a hot-water supply system, air-conditioning equipment, etc. are set up and integrated by the setting out 72 of various installation specification. In the specification 73 about exterior, an outside wall, revegetation and a parking space, a gate, a drain, etc. are set up and integrated. Furthermore by the specification 74 of building each part, materials, such as a floor of each part store, a wall, a ceiling, and fittings, are set up and integrated. Since the materials corresponding to each setting-out item are determined here, the trial calculation of expense is made automatically. In the check item in "addition", it is also an item in which a user's liking and taste appear, and the expense added to the minimum expense or the expense carried out in "planning" 60 more than needed is shown. According to the convenience of a budget, the item set up in "addition" of 70 items is considered as re-evaluation, and outline design is performed, narrowing down to the budget considered as a user's request.

[0115]Next, "addition" 70 are *****, when it explains using drawing 8, and outline design "planning" 60 by a user were performed and the check was ended as mentioned above according to each check item. The outline design data obtained by these outline design work is carried out accumulation 80.

[0116]Next, it explains using drawing 9. The outline design data 75 is obtained by the above work, and addition and correction 90 by revision of a new element and an existing element are made by the design special person who has a know how. A design data is carried out accumulation 91, grasp of the request content and tendency of a user is performed, and 92 and marketing analysis 93 are performed to the server side by it. By marketing analysis, presentation of the recommendation design plan according to a budget and the simulation of a budget and a planning should do. These result data is fed back for new construction of a space object database, and the "commodity retrieval by plan search" screen on a homepage is carried out updating 94. Here, if a recommendation design plan is described, the residence considered as a user's request with a user's family structure, budget planning, a life style, etc. is various. For example, by the user of local city region living, and the user of region living in the center of Tokyo, the hope of

users, such as 2 stories or 3 stories, and basement existence, may change with land area which a user generally owns. Therefore, the various design plans as which the user's hope was considered beforehand are called for. It makes it still easier for a user to perform outline design by such a thing for which many various recommendation design plans are shown to a user's needs.

[0117]On the other hand, in the design data [addition / correction 90] based on the outline design data 75, a design special person performs the drawing processing 95 and various list processings 96, and does design specifications and an estimate creation 97. The design document 52 drawn up and outputted by the above-mentioned work is shown and indicated to a user.

[0118]Each work 90 by additional correction etc. is done based on the outline design data 75 in which a user's request was reflected as mentioned above, and it becomes the presentation 94 of a recommendation design plan, or presentation of the design document 52.

[0119]Next, drawing 10 shows the approximate account of the data section especially in 40 copies of business-use space object databases also in the flow until [whole] a user takes part in a design and a construction thing is handed over to a user.

[0120]Furthermore, drawing 11 is a work-flows figure in drawing 10. A user performs outline design using the business-use space object database 40. When the contract 100 is furthermore concluded, as a result of the designer who has a know how based on the outline design data 75 performing the detail design 104 by additional correction etc., a design document, an estimate, etc. are carried out creation 105, and the work flow until it explains by performing presentation and an indication to a user is shown roughly.

[0121]When the contract 100 is not concluded, a designer makes addition and correction of outline design data, and performs the grasp 102 of the needs of 101 and a user. Therefore, creation 103 of the recommendation plan about a housing plan is enabled, and these recommendation plan is used for the renewal 94 of the homepage top "commodity selection by plan search" screen for performing outline design.

[0122]In the design document 52 drawn up here, there are structural drawing, an equipment drawing, a water-works piping diagram, an electrical diagram, a number-of-bearing-walls statement, etc. also in a top view, an elevational view, a plot plan, a site investigation figure, an estimate, and others. A user is given by a designer for these design documents, and performs check and consent. In this case, since the user took part in the planning of outline design beforehand, he is easy to understand about the semantic content of a design document.

[0123]Next, in drawing 12, the approximate account of the whole housing plan supporting system until a construction thing is handed over to a user and maintains from a design to a construction article is performed. Furthermore, the work flows of this whole system are explained using drawing 13. The cooperation design with the design department 142 and the brokerage department 141 is enabled because the user 51 participates in a design in outline design as point ** was carried out.

[0124]When the contract 100 is not concluded, a user's needs are grasped as having carried out point **, and the needs trend database 121 is built by storing data. Furthermore, a needs trend database performs the reconstruction 120 of a business-use space object database. A reconstruction item comprises "creation of geometrical modelling and part model" 120a, "registered into parts master" b, and an item "transplanting to business use". ["simulation of new parts"] [120c and] [of 120d] Therefore, it becomes possible to show the design recommendation plan corresponding to the user's needs, and these enable renewal of "commodity selection by plan search" 94 for performing outline design of a design support homepage.

[0125]On the other hand, a designer performs the detail design 104 by an addition, correction, etc. to the outline design data 75 after contract 100 conclusion. Based on this detail design data 130, the design document 52 is drawn up and it is shown to a user. An understanding of special and technical contents and the check judgment of a design document of a user which are written in a design document are attained by having participated in the design. The design document to which the user has checked and consented is submitted to a government office, and the

application for building confirmation of construction is performed.

[0126]Based on these detail design data 130, a designer becomes possible [performing exact addition]. When there is no problem in a design document etc., a user performs a service contract with a builder, and when an application for building confirmation gets down, it is supplied, and the construction 143 is started.

[0127]As for the designer, in presentation and also the detail design data 130, parts data, member data, etc. contain the design document 52 to the builder, and the order 123 of creation, parts, etc. is made in a working budget document based on the detail design data 130 with an injection start. The physical distribution service section 146 performs a material procurement based on the detail design data 130, and, as for the factory parts 132 and the on-site parts 131 which were these-ordered, construction material of materials, quantity, etc. are carried out management 133.

[0128]As for the factory parts 132, production control is performed at the factory 150. The delivery to the job site 148 of the production part article to the construction article for every user is managed, and the schedule control in assembly production and delivery of factory parts is performed further. After the material procurement of each part article is performed based on the detail design data 130 and one on-site parts 131 are directly delivered by the job site 148, they are used for a foundation foundation etc.

[0129]Furthermore, based on the detail design data 130, field management (using the original managerial system of a housebuilder) 124 is performed by the housebuilder, and the schedule control of the completion situation of construction is done. When construction completion is carried out, the complete examination 125 by the government office and a supervising architect to a construction article is conducted.

[0130]At any time, about the contents of completion and inspection result, a field management person performs data input and, therefore, the means of a user perusing the completion situation of construction on 127, the E-mail which used the communication line, for example, and a homepage enables it to obtain the environment which can always supervise a completion situation. A series of building work makes it possible for the work in each section to cooperate and to manage it based on detail design data. It is possible to acquire effects, such as to become possible to attain the increase in efficiency of a process of operation, and to prevent the delay of a construction period and a work error.

[0131]126 by which a construction article is handed over to a user when the above-mentioned complete examination is passed. 128 which inputs the requirements for a user in order to receive to a user and to perform complaint reception as the after-sale service 134, a periodic visit, etc. in the maintenance service business 147 in a housebuilder -- it is things and the construction object database 129 is built.

[0132]A construction object database is equipped on a server and speeding up of maintenance work is enabled by making it operate on a homepage. For example, besides in case maintenance work is performed based on the data inputted by the user on the homepage. Various sensors (inclination perception, leakage-of-water perception, dew condensation perception in the inside of a wall, etc.) are installed in a construction article, abnormalities are perceived automatically, and the maintenance work by the automatic supervision of a housebuilder becomes possible by these data being transmitted automatically to a server.

[0133]Thus, as for this invention, it is needless to say that various embodiments which have not been indicated here are included. Therefore, the technical scope of this invention is appointed only by the invention specific matter which starts an appropriate claim from the above-mentioned explanation.

[0134]

[Effect of the Invention]As mentioned above, a means to set up the homepage for housing plans for a user to peruse according to this invention. The user appointed field for a user to perform outline design of a residence without including a planning field on a homepage or containing. The request input means which inputs the matter which a user demands in the user appointed field. A means by which the design supporting database with which the server was equipped beforehand is connected with a homepage, and the design supporting database operates on a homepage. The

checking means performed by relating with the request input item inputted into the user appointed field when the design supporting database operated, By comprising at least a reporting means which notifies a user of the result obtained by a checking means, it enables him for a user to participate in a design easily, to perform outline design, and to perform a cooperation design with a brokerage department and a design department.

[0135]Furthermore on a homepage, an addition field for a user to perform outline design of a residence is formed, and further a checking means, including at least one of compatibility with a site condition and a budget, related laws and regulations, and roof shape, the safety as a structure, and the functions as a dwelling, further an addition field, A user is enabled to perform outline design by including at least one of setting out of the specification about setting out of the simulation and the various installation specification to a budget, and exterior, and the setting out of building each part specification.

[0136]Correct the inconvenience produced by the checking means and without a user's comprehension or comprehension, As opposed to the outline design data created based on the user appointed field and request input item which were further corrected by the after-check correcting means or the reporting means including the after-check correcting means which corrects the user appointed field, He is enabled for a user to participate in a design easily and to perform a cooperation design with a brokerage department and a design department by having a judgment field about conclusion of the deal on a homepage.

[0137]When it is furthermore considered as "no" in a conclusion-of-the-deal judgment field according to this invention, by grasp of the user request content made into "no", and its tendency. The needs trend database construction means related with outline design data, It has a reconstruction means of the design supporting database which is updated by the design supporting database and needs trend database with which the server was equipped beforehand, and is associated, The design means of the recommendation design plan which is furthermore related with a needs trend database and a design special person performs, It becomes possible to provide the housing plan which fills many the presentation of a housing plan recommendation plan and the user requests corresponding to the user's needs by having a means to show a homepage a recommendation design plan, and an outline design means which a user performs by relating with a recommendation design plan.

[0138]The detail design means which is related with outline design data and a design special person performs when it is furthermore considered as "formation" in a conclusion-of-the-deal judgment field according to this invention, It becomes possible to connect the building work process of ***** based on the data designed by the user by having at least one means of the construction means related with detail design data, and the maintenance means performed to the construction article built by the construction means.

[0139]Furthermore, according to this invention, a detail design means by the output means of the design document related with detail design data, and the application-for-building-confirmation means about the construction performed with a design document. A user receives the presentation and detailed explanation of a design document which are obtained by a detail design from a designer, an understanding is made possible about special contents, and it becomes possible to perform an application for building confirmation.

[0140]The output means of the working budget document which the construction means was related with detail design data, and was drawn up, The placing means of the factory parts related with detail design data, and on-site parts, By having at least one means of the field management means of the completion situation related with detail design data, the inspection means of the building related with detail design data, and the delivered means of the construction article related with detail design data, It becomes possible to perform a series of housing construction synthetically managed based on the design data.

[0141]The material procurement to which the section specializing in a physical distribution service carries out the placing means of factory parts, including at least one of the schedule control in connection with subassembly production and part production, and the delivery managements of a finished part, further the inspection means of a building. The completion information which shows the contents of completion in connection with the completion situation

related with detail design data, It becomes possible to perform a series of housing construction synthetically managed based on the design data by including at least the output means which notifies a user of the construction condition data obtained using complete examination result information, and the completion information and complete examination result information on the building related with detail design data.

[0142]According to this invention, a maintenance means, The construction means of the construction object database related with the construction object data accumulated from the input means of the requirements for a user, A means by which a homepage and the construction object database with which the server was equipped beforehand are connected, and the construction object database operates on a homepage, By comprising at least maintenance service business over the construction article related with the construction object database, It becomes possible to perform promptly maintenance management by which efficient-izing and automation are made to the construction article of a post turnover using the database in connection with the construction article handed over to the user.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] It is an approximate account figure showing an example of hard structure.
- [Drawing 2] It is a key map in a client/server architecture.
- [Drawing 3] It is an explanatory view showing the work sequence in a client/server architecture.
- [Drawing 4] It is a schematic diagram about the user participatory type housing plan supporting system use on the Internet.
- [Drawing 5] It is a block diagram in a user participatory type housing plan supporting system showing the flow of a design data.
- [Drawing 6] It is a functional flow chart of the outline design planning which a user performs.
- [Drawing 7] It is a functional flow chart of the outline design addition estimate which a user performs.
- [Drawing 8] It is a functional flow chart to the addition from a planning in the outline design which a user performs.
- [Drawing 9] It is a functional flow chart of the case where a design plan is updated based on the outline design which a user performs, and the case where a design document is outputted.
- [Drawing 10] It is an approximate account figure of the business-use space object database part in a user participatory type housing plan supporting system.
- [Drawing 11] It is a functional flow chart in a business-use space object database part.
- [Drawing 12] It is an approximate account figure of the whole user participatory type housing plan supporting system.
- [Drawing 13] It is a functional flow chart in the whole user participatory type housing plan supporting system.
- [Drawing 14] It is a flow chart for explaining the work sequence of the client/server architecture in drawing 3 in full detail.
- [Drawing 15] It is a setting-out example of the room space which a user or a designer assumes themselves.
- [Drawing 16] It is a multiple pillar figure obtained to the room space illustrated in drawing 15 by the geometrical modelling as a generated multiple pillar.
- [Drawing 17] It is a room space figure showing the mutual position relation between a standard layer and an arbitrary layer.
- [Drawing 18] It is a room space figure showing the data of the corner part of a standard layer, and the halfway point between corners.
- [Drawing 19] They are a part of pillar pass (standard layer), some (standard layer) design results of a framing elevation, and some addition lists.
- [Description of Notations]
- S Designing device
- 10 Input means
- 12 Calculating means
- 14 Memory measure
- 16 Output means
- 16a Printer

16b Monitor
16c Communication port
30 HTML+Applet
31 Housing plan object
32 Department-for-housing article master
33 Housing plan engine
34 CORBA Service
35 Rule base engine
36 Design model rule base group
36a Beam arrangement rule base
36b Pillar arrangement rule base
36c Fittings arrangement rule base
37 Gate Keeper
38 WWW Server
39 Housing plan support homepage
39a WWW browser
39b CAD browser
40 Business-use space object database
41 The component of a building (design result data)
42 Common model
43 Geometrical modelling
44 Structural part model
45 Design model
46 Internet
47 User (client)
47a User : house
47b User : establishment
47c User : house exhibition halls
50 Outline design : commodity selection by plan search
51 User
52 Design document
60 Outline design a "planning"
61 The check about a site condition and a budget
62 The check about related laws and regulations
63 The check of roof-shaped compatibility
64 The check of the safety as a structure
65 The check of the function as a dwelling
66 The check of the compatibility on solid geometry
70 Outline design "addition estimate"
71 The simulation to a budget
72 Setting out of various installation specification
73 Setting out of the specification about exterior
74 Setting out of the specification of building each part
75 Outline design data
80 Accumulation of live data and historical data
90 The addition and correction by revision of a new element and an existing element
91 Accumulation of live data
92 The request content and grasp of a tendency of a user
93 Marketing analysis : the simulation of a budget and a planning
Presentation of the recommendation plan according to a budget
94 Renewal of a homepage "commodity selection by plan search"
95 Drawing processing
96 Various list processings
97 Creation of engineering drawing and an estimate

- 100 Contract : conclusion judgment
- 101 An addition and correction of the element revised among the new element and the existing element
- 102 The request content and grasp of a tendency of a user
- 103 Creation of the recommendation plan according to a budget
- 104 Detail design : the data check and the additional input for design-document creation
- 105 Creation of engineering drawing, an estimate, etc.
- 120 Construction of the space object database to a new product
- 120a Creation of geometrical modelling and a part model
- 120b Register with a parts master.
- 120c The simulation of new parts
- 120 d is transplanted to business use.
- 121 Needs trend database
- 122 Creation of a working budget document : data check and an additional input
- 123 Order : data check and an additional input
- 124 Field management
- 125 Complete examination
- 126 Delivery
- 127 The input of an inspection result and the contents of completion
- 128 The input of the requirements for a user
- 129 Construction object database
- 130 Detail design data : the component of a building
- 131 On-site parts
- 132 Factory parts
- 133 Physical distribution (supply production in addition to this)
- 134 Maintenance (complaint reception periodic visit in addition to this)
- 140 Development departments
- 141 Brokerage department
- 142 Design department
- 143 Construction section
- 144 Development business
- 145 Processing order business
- 146 Physical distribution service
- 147 Maintenance service business
- 148 Job site
- 149 Contractor
- 150 Factory

[Translation done.]